

***FlyBy Math™* Alignment**  
**Essential Academic Learning Requirements**  
**And Grade Level Expectations**

**EALR 1: The student understands and applies the concepts and procedures of mathematics.**

**Component 1.1: Understand and apply concepts and procedures from number sense.**

**NUMBER AND NUMERATION**

***GLE 1.1.4 Understand the concept of direct proportion.***

<b>Evidences of Learning</b>	<b><i>FlyBy Math™</i> Activities</b>
<ul style="list-style-type: none"> <li>Express proportional relationships using objects, pictures, and symbols.</li> </ul>	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.
<ul style="list-style-type: none"> <li>Solve problems involving proportions.</li> </ul>	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.
<ul style="list-style-type: none"> <li>Use ratios to make predictions about proportions in a future situation.</li> </ul>	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

**Component 1.3: Understand and apply concepts and procedures from geometric sense.**

**LOCATIONS AND TRANSFORMATIONS**

***GLE 1.3.3 Understand the location of points on a coordinate grid in any of the four quadrants.***

<b>Evidences of Learning</b>	<b><i>FlyBy Math™</i> Activities</b>
<ul style="list-style-type: none"> <li>Plot and label ordered pairs in any of the four quadrants.</li> </ul>	--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.

**Component 1.4: Understand and apply concepts and procedures from probability and statistics.**

**STATISTICS**

***GLE 1.4.5 Understand and apply various data display techniques including box-and-whisker plots.***

<b>Evidences of Learning</b>	<b><i>FlyBy Math™</i> Activities</b>
<ul style="list-style-type: none"> <li>Read and interpret various data displays.</li> </ul>	--Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
<ul style="list-style-type: none"> <li>Construct bar graphs, circle graphs, line graphs, box-and-whisker and scatter plots using collected data.</li> </ul>	--Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs.
<ul style="list-style-type: none"> <li>Compare different graphical representations of the</li> </ul>	--Choose among tables, bar graphs, line graphs, a

same data.	Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
------------	--

## **Component 1.5: Understand and apply concepts and procedures from algebraic sense.**

### **PATTERNS, FUNCTIONS, AND OTHER RELATIONS**

#### ***GLE 1.5.1 Apply understanding of linear relationships to analyze patterns, sequences, and situations.***

<b>Evidences of Learning</b>	<b><i>FlyBy Math™</i> Activities</b>
<ul style="list-style-type: none"> <li>Identify, extend, or represent patterns and sequences using tables, graphs, or expressions.</li> </ul>	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
<ul style="list-style-type: none"> <li>Make predictions using linear relationships in situations.</li> </ul>	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
<ul style="list-style-type: none"> <li>Create a representation of a linear relationship given a rule.</li> </ul>	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

### **SYMBOLS AND REPRESENTATIONS**

#### ***GLE 1.5.4 Apply understanding of equations, tables, and graphs to represent situations involving linear relationships.***

<b>Evidences of Learning</b>	<b><i>FlyBy Math™</i> Activities</b>
<ul style="list-style-type: none"> <li>Represent linear relationships through expressions, equations, tables, and graphs of situations involving non-negative rational numbers.</li> </ul>	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
<ul style="list-style-type: none"> <li>Graph data to demonstrate relationships in familiar contexts.</li> </ul>	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
<ul style="list-style-type: none"> <li>Create a table or graph given a description of, or an equation for, a situation involving a linear relationship.</li> </ul>	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

### **EVALUATING AND SOLVING**

#### ***GLE 1.5.5 Understand and apply procedures to evaluate expressions and formulas considering order of operations.***

<b>Evidences of Learning</b>	<b><i>FlyBy Math™</i> Activities</b>
<ul style="list-style-type: none"> <li>Evaluate expressions and formulas considering order of operations.</li> </ul>	--Use the distance-rate-time formula to predict and analyze aircraft conflicts.

**EALR 2: The student uses mathematics to define and solve problems.****Component 2.1: Understand problems.****GLE 2.1.1 Analyze a situation to define a problem.****Evidences of Learning**

- Define the problem.

**FlyBy Math™ Activities**

--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.

**Component 2.2: Apply strategies to construct solutions.****GLE 2.2.1 Apply strategies, concepts, and procedures to devise a plan to solve the problem.****Evidences of Learning**

- Select and apply appropriate mathematical tools for a situation.

**FlyBy Math™ Activities**

--Conduct simulation and measurement for several aircraft conflict problems.

--Use tables, graphs, and equations to solve aircraft conflict problems.

**GLE 2.2.2 Apply mathematical tools to solve the problem.****Evidences of Learning**

- Implement the plan devised to solve the problem.

**FlyBy Math™ Activities**

--Conduct simulation and measurement for several aircraft conflict problems.

--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

- Check the solution to see if it works.

--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

--Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

**EALR 3: The student uses mathematical reasoning.****Component 3.2: Make predictions, inferences, conjectures, and draw conclusions.****GLE 3.2.1 Apply prediction and inference skills to make or evaluate conjectures.****Evidences of Learning****FlyBy Math™ Activities**

--Predict outcomes and explain results of mathematical models and experiments.

--Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

**GLE 3.2.2 Apply the skills of drawing conclusions and support the conclusions using evidence.**

<b>Evidences of Learning</b>	<b>FlyBy Math™ Activities</b>
<ul style="list-style-type: none"><li>Draw conclusions from displays, texts, or oral discussions and justify those conclusions with logical reasoning or other evidence.</li></ul>	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

**Component 3.3: Verify results**

**GLE 3.3.1 Analyze procedures and information used to justify results using evidence.**

<b>Evidences of Learning</b>	<b>FlyBy Math™ Activities</b>
<ul style="list-style-type: none"><li>Justify the reasonableness of an estimate.</li></ul>	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.  --Compare predictions, calculations, and experimental evidence for several aircraft conflict problems.

**EALR 4: The student communicates knowledge and understanding in both everyday and mathematical language.**

**Component 4.1: Gather information.**

**GLE 4.1.2 Understand how to extract information from multiple sources using reading, listening, and observation.**

<b>Evidences of Learning</b>	<b>FlyBy Math™ Activities</b>
<ul style="list-style-type: none"><li>Create a table or graph given a description of, or an equation for, a situation involving a linear or non-linear relationship.</li></ul>	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

**Component 4.2: Organize, represent, and share information.**

**GLE 4.2.2 Apply communication skills to clearly and effectively express or present ideas and situations using mathematical language or notation.**

<b>Evidences of Learning</b>	<b>FlyBy Math™ Activities</b>
<ul style="list-style-type: none"><li>Clearly explain, describe, or represent mathematical information in a pictorial, tabular, graphical, two- or three-dimensional drawing, or other form as appropriate for the mathematical information (e.g., time, distance, categories), audience, and/or purpose, such as to perform or persuade, with notation and labels as needed.</li></ul>	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.  --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

**EALR 5: The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.**

**Component 5.1: Relate concepts and procedures within mathematics.**

***GLE 5.1.1 Apply concepts and procedures from a variety of mathematical areas in a given problem or situation.***

<p><b>Evidences of Learning</b></p> <ul style="list-style-type: none"> <li>Given a set of data, compare various representations (e.g., box-and-whisker, bar, circle graph) for a given situation.</li> </ul>	<p><b><i>FlyBy Math™ Activities</i></b></p> <p>--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p> <p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p>
--	--

***GLE 5.1.2 Apply different mathematical models and representations to the same situation.***

<p><b>Evidences of Learning</b></p> <ul style="list-style-type: none"> <li>Match a situation with a data set or graph.</li> </ul>	<p><b><i>FlyBy Math™ Activities</i></b></p> <p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p>
---	--

**Component 5.3: Relate mathematical concepts procedures to real-world situations.**

***GLE 5.3.1 Understand that mathematics is used in daily life and extensively outside the classroom.***

<p><b>Evidences of Learning</b></p>	<p><b><i>FlyBy Math™ Activities</i></b></p> <p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p>
-------------------------------------	--

***GLE 5.3.2 Understand that mathematics is used within many occupations or careers.***

<p><b>Evidences of Learning</b></p> <ul style="list-style-type: none"> <li>Explain how mathematics is used in careers or occupations of interest (e.g., complete a mathematically based project).</li> </ul>	<p><b><i>FlyBy Math™ Activities</i></b></p> <p>--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.</p>
--	--